

SEP 29 2005

HUBR-1165 (10023593)
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : Stuke, et al.
Serial No. : 09/647,207
Filed : January 8, 2001
For : ADHESIVE-FREE BONDING OF POLYMERIC
COMPONENTS TO PRODUCE CLOSED MICRO- AND
NANOCHANNEL STRUCTURES
Art Unit : 1733
Examiner : J. Rossi

September 29, 2005

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Eileen Sheffield 9/29/05
Eileen Sheffield

REPLY BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

As required under § 41.41(a)(1), this reply brief is filed within two months of the Examiner's Answer mailed August 3, 2005.

Any fee required may be charged to deposit account no. 50-0624.

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In the Examiner's Answer, with respect to the primary rejection of claims 23-24, 26-29, 31-34, 36 and 45-46 as allegedly obvious over the combination of Soane et al. ("Soane"), McReynolds and Oshida, the examiner acknowledges that Soane "...fails to disclose any specifics pertaining to this cooling step...is silent as to Applicant's claimed pressure range, holding the substrate and cover at the heating temperature for at least 15 minutes, and cooling for up to 30 seconds down to a temperature of about 40°C." In other words, the Examiner acknowledges that many of the features of claim 23, particularly features found in items (b), (c) and (d) of claim 23, the sole independent claim, are simply not found in Soane. McReynolds and Oshida are cited for providing the missing features.

At page 10 of the Answer, the Examiner reiterates "that Soane points out that the temperature is held "for a time period sufficient to allow the polymer molecules to interpenetrate the polymeric surfaces of the substrate and cover and create a morphological bonding" at col. 3, lines 1-4)" (emphasis in the original). The claimed range, however, is not taught or suggested.

To reiterate, Soane does not disclose a) the heating time (but does disclose heating to a temperature that is 2 to 5°C above the glass transition temperature of the polymer at Col. 2, lines 63-65), b) the pressure range and, c) the cooling time and end temperature as claimed in independent claim 23.

McReynolds only generally discloses that the applied temperature and pressure will depend on the nature of the polymeric material (column 4, lines 32-36), for example PMMA (column 3, line 34), but, like Soane, does not disclose a holding time for the heating step either. There is simply no specific disclosure of this feature in either Soane or McReynolds, nor do either of Oshida or Parce disclose this feature.

Oshida discloses general methods for the adhesive-free combination of two polymeric components. Oshida does not disclose that there are depressions in the components and, therefore, Oshida is not concerned with solutions providing a smooth, crack-free bond between the two components, specifically where the depressions are found. The two components in

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Oshida are pre-heated (see, e.g., claims 1, steps (a) and (b)), to slightly under their glass transition temperature, pressed together, and then heated under pressure to a temperature of about 20° to 50°C above the glass transition temperature (see Oshida's claim 1, step c). Oshida does disclose a process pressure range of 100-400 g/mm² (which=10-40 kg/cm², column 3, Table). Oshida also discloses a glass transition temperature of 87°C and a cooling speed of 5°C/second down to 55°C/second, and then natural cooling (column 3, lines 19 to 29), which results in a total cooling time of $(87-55) / 5 = 6.4$ seconds.

Further, Oshida discloses a material having a glass transition temperature of 50°C cooled down with 5°C/second to 30°C lower than the glass transition temperature of 50°C (= 20°, column 2, lines 6 to 10, and line 55), which results in a total cooling time of $30 / 5 = 6$ seconds.

In the former case, the high end temperature of 55°C, which is considerably above presently claimed (about 40°C) and, in the latter case considerably lower (25°C), which is a remarkable difference. There is no hint or suggestion of using the claimed range.

Importantly, it is reiterated that Oshida, like Soane and McReynolds also fails to disclose a heating time, and, furthermore, Oshida does not disclose the presence of micro- or nanochannels. Thus, those in the art would not apply the overall teaching of Oshida or even parts thereof into consideration, because Oshida does not disclose and is not concerned with micro- or nano-channels, a concern of the present invention. One reading Oshida would not be lead to provide a holding time for the substrate with the covering within $\pm 3^\circ\text{C}$ of the heating temperature for at least 15 minutes, as claimed in claim 23, step (c). The claimed holding time leads to a thorough bonding of the two members in a sufficient time of at least 15 minutes, without generating irregularities, burs, etc. which could project into the microchannel, impeding the optical qualities of the polymeric member as a relative movement between the components is restricted.

Therefore, the holding time of at least 15 minutes as claimed in claim 23, is a feature of the present invention which is taught or suggested by any of Soane, Oshida or McReynolds, either alone or in combination, and Parce does nothing to overcome this deficiency.

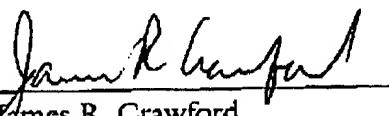
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It is respectfully submitted that the Examiner has failed to set forth a *prima facia* case of obviousness because each and every limitation of the claim is not taught or suggested by the cited references. The only possible way the Examiner could arrive at the presently claimed invention is through the improper use of hindsight.

In view of the foregoing, Applicants respectfully request reversal of the rejections.

Respectfully submitted,

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